

C L A I M S.

1. Method for treatment of a liquid that contains live organisms, where the treatment comprises destruction of live organisms as the liquid is in a treatment component (29, 31) in a treatment installation (26),

c h a r a c t e r i s e d i n

that the liquid with the live organisms is subjected to an electron radiation as the liquid is led through an internal passage (49) in the treatment component (29, 31) in a forced flow movement through the passage (49).

2. Method according to claim 1,

c h a r a c t e r i s e d i n

that during the flow through the pipe-formed passage (49) the liquid is subjected to the influence of at least one alternating current field which is limited locally inside an electrically insulating case (48) that surrounds the pipe-formed passage (49), and

that said alternating current field activates the flow of liquid in the flow cross section of the passage (49) for destruction of organisms present in the flow of liquid.

3. Method according to claim 2,

c h a r a c t e r i s e d i n

that said alternating current field activates the flow of liquid in the whole of the flow cross section of the passage (49).

4. Method according to claims 2 or 3,

c h a r a c t e r i s e d i n

that said alternating current field activates the flow of liquid in an axially limited area within opposite ends of the electrically insulating case (48) that surrounds the pipe-formed passage (49).

5. Method according to one of the claims 1 – 4,

c h a r a c t e r i s e d i n

that the flow of fluid which is fed to the treatment installation (26) is led, in parallel, through at least two mutually parallel pipe-formed passages (49), which each is subjected to the influence of at least one alternating current field.

6. Method according to claim 5,  
characterised in

that the flow capacity through said at least two mutually parallel, pipe-formed passages (49), is largely corresponding to the flow capacity upstream in the treatment installation (26).

7. Method according to claim 5,  
characterised in

that the flow capacity through said at least two mutually parallel, pipe-formed passages (49), exceeds the flow capacity upstream in the treatment installation (26).

8. Method according to one of the claims 1 – 7,  
characterised in

that a passage (49) with an internal diameter of about 5 inches (about 12.5 cm) or less is used.

9. Method according to one of the claims 1 – 8,  
characterised in

that organisms that are in the flow of liquid upstream of the treatment passage (49) of the treatment installation (26) are subjected to mechanical breakdown at the passage of a crushing device (31) which is arranged in the flow of liquid upstream of the treatment passage (49).

10. Installation for treatment of a liquid that contains live organisms, encompassing devices (12) for handling of the liquid in the treatment installation (26) and also a treatment component (29, 31) that contains devices for destruction of live organisms in the flow of liquid,  
characterised by the combination

a) of first devices (12) to guide the liquid in a forced flow movement in an internal passage (48) through the treatment component (29, 31), and

b) of other devices localised in the treatment component to subject the live organisms in the flow of liquid to an electron radiation in the internal passage (49) in the treatment component (29, 31).

11. Treatment installation according to claim 10,  
characterised in

that the treatment component (29, 31) is arranged to be easily fastened and easily detached in connection with the associated pipeline (28, 30) of the treatment installation (26).

12. Treatment installation according to claims 10 and 11,  
characterised in

that the devices for electron radiation of the flow of liquid in the treatment component (29,31) comprise a pipe-formed liquid passage (49) through a case (48) of electrically insulating material and at least two electric conductors (50) that are connected to an alternating current source for activation of at least one alternating current field in the flow of liquid through the pipe-formed passage (49)

as the electric conductors (50) are in direct electrical contact with the flow of liquid through the pipe-formed passage.

13. Treatment installation according to one of the claims 10-12,  
characterised in

that the electric conductors (50) are arranged at a mutual distance apart which ensures that the flow of liquid through the pipe-formed passage (49) is activated by the alternating current field in the whole cross section of the passage (49),

as the amperage is set at a level which preferably exceeds 25A.

14. Treatment installation according to one of the claims 10-13,  
characterised in

that the treatment component (29,31) encompasses a pipe bundle (48a-48f) that comprises at least two mutually parallel, electrically insulating, pipe-formed cases (40) each with its pipe-formed internal passage (49) and each with its own set of internally arranged electric conductors (50), and

that the pipe bundle (48a-48f) is fastened in the treatment component (29,31) so that it is easily fitted and dismantled.

15. Treatment installation according to claim 14,  
characterised in

that the pipe-bundle (48a-48f) is surrounded by a rigid coat (47), which forms an external protecting body for the pipe bundle (48a-48f) and which forms a carrier body for electrical equipment (53) for transfer of electrical current to the pipe-bundle (48a-48f), and

that the coat (47) comprises to and from revolving, mutually locking coat part (47a, 47b) for access to the pipe-bundle (48a-48f).

16. Treatment installation according to claim 15,  
characterised in

that the one coat part (47b) of the coat (47) and the pipe bundle (48a-48f), respectively, each carry its own electrical circuit breaking arrangements (53, 54) for connection and disconnection of alternating current to the pipe bundle (48a-48f), and

that the connection and the disconnection of the circuit breaking arrangements (53, 54) are ensured by the revolving of the mentioned coat part (47b) in relation to the pipe-bundle (48a-48f).

17. Treatment installation according to one of the claims 10-16,  
characterised in

that the installation encompasses an additional component (31'') for mechanical crushing of macroorganisms,

as the additional component (31'') is arranged in the treatment installation (16) upstream of the treatment component (29, 31) of the installation, and

that the flow of liquid from the additional component (31'') communicates directly with the treatment component (29, 31).

18. Treatment component (29,30) for use in an installation (16) for treatment of a liquid that contains live organisms, where the treatment component (29,30) comprises devices for handling of the liquid and also devices for destruction of live organisms in the liquid,

characterised by the combination

a) of a case (48) that is manufactured from an electrically insulating material and which surrounds an internal passage (49) to lead the liquid in a forced flow movement through the treatment component (29,30), and

b) a set of at least two electric conductors (50) that are arranged on the inside of the case (48) in direct contact with the flow of liquid through the case (48) and which are connected to a power supply to subject live organisms in the liquid flow to an electron radiation between the electric conductors (50) in the internal passage (49) in the treatment component (29,30)

19. Treatment component according to claim 18,  
characterised in

that the pipe-formed passage (49) contains at least two electric conductors (50) that are connected to an alternating current source to set up an alternating current field in the cross section of the passage (49), and

that the electric conductors (50) are arranged a mutual distance apart which ensures that the flow of liquid through the pipe-formed passage (49) is activated in the cross section of the passage by an alternating current field between the electric conductors (50).

20. Treatment component according to claim 19,  
characterised in

that it contains a pipe bundle (48a-48f) which is replaceably fitted in relation to the treatment component (2,31), and

that the pipe bundle (48a-48f) comprises a number of mutually parallel running passages (49), each being surrounded and limited by an electrically insulating, pipe-formed case (48).

21. Treatment component according to one of the claims 18-20,  
characterised in

that the flow cross section in the pipe connection (41) upstream of the treatment component (29, 31) corresponds approximately to the combined flow cross section in the mutually parallel-running passages in the pipe-bundle (48a-48f).

22. Treatment component according to one of the claims 18-20,  
characterised in

that the flow cross section in the pipe connection (41) upstream of the treatment component (29,31) is less than the combined flow cross section in the mutually parallel-running passages (49) of the pipe-bundle (48a-48f).

23. Treatment component according to one of the claims 20-22,  
characterised in

that the pipe bundle (48a-48f) of the component is surrounded by a rigid coat (47) that forms an external protective arrangement for the pipe bundle (48a-48f) and which forms a carrier body for circuit breaker (53,54) for power supply for operation of the treatment component (29,31), and

that the coat (47) comprises at least two to and fro revolving coat parts (47a, 47b) for easy access to the pipe bundle (48a-48f).

24. Treatment component according to claim 23,  
characterised in

that the circuit breaker device comprises two circuit breaker parts (53,54) which are arranged in the space between the coat (47) and the pipe bundle (48a-48f),

as the one circuit breaker part (53) is fastened to the one coat part (47b) of the coat(47), while the other circuit breaker part (54) is fastened to the pipe bundle (48a-48f), and

that the circuit breaker device (53,54) is opened and closed by opening and closing of the coat (47)

25. Treatment component according to one of the claims 18-24,  
characterised in

that the treatment component (29,31), which constitutes a main component in the treatment installation (26), can be connected to an additional component (31'') which is arranged for mechanical crushing of macroorganisms in the liquid flow upstream of the main component (29,31), as the flow of liquid from the mentioned additional component (31'') communicates directly with the main component (29,31).